

Specific comments.

The comments given below cite the page and line number (e.g. 11173/4 is page 11173, line 4), the text as given in the paper in quotes, and the suggested alternative following “=”.

11173/4: “its expansion over large ranges of latitude” = “its extent over large ranges of latitude.”

Corrected

11173/7: “annual and interannual time scale” = “annual and interannual time scales”.

Corrected

11173/11: “and drive modification in the radiative and hydrological balances” = “and lead to changes in the radiation and water balances”.

Corrected

11173/20: “was found in the basins pertaining to other Amazonian countries” = “was found in the basins lying in other Amazonian countries”.

Corrected

11173/24: “and allowed a great improvement of the simulation” = “and led to great improvement in the simulation”.

Corrected

11176/3: “the discharge simulations forced by NCC pointed out” = “the discharge simulations forced by NCC identified”.

Corrected

11177/14: “no complex scenario such as deforestation, land use or forest fire are taken into account in this study” = “complex scenarios such as deforestation, land use or forest fire are not taken into account in this study”. Or “no complex scenario such as deforestation, land use or forest fire is taken into account in this study”.

Corrected

11177/23: “and hydrological balance is computed for each one” = “and a water balance is computed for each one”.

Corrected

11179/9: “Three reservoirs are allocated to each sub-basins” = “Three reservoirs are allocated to each sub-basin”.

Corrected

11180/23 to-11181/3: “Those figures are the same for all the basins of the world. The resulting product $g_i \cdot k$ represents the time constant $T_i(\text{day})$ which is an e-folding time, the

time necessary for the water amount in the stream reservoir to decrease by a factor e .” I do not understand what is meant by the term “e-folding”.

The term “E-folding time” is commonly used to represent the response time of a reservoir characterizing the adjustment to equilibrium after a sudden change in the system. With an exponential adjustment, the response time is defined as the time it takes to reduce the imbalance to $1/e=37\%$ of the initial imbalance. For a single reservoir with a sink proportional to its content, the response time equals the turnover time (Butcher & al., 1992).

Global Biogeochemical Cycles, 1992. Samuel S. Butcher, Robert J. Charlson, Gordon H. Orians and Gordon V. Wolfe. ISBN: 978-0-12-147685-4

11181/12: “of the Amazon River basin strongly affected by inundations”= “of the Amazon River basin strongly affected by flooding”.

Corrected

11183/1: “The data has allowed to simulate the 50-yr river flows over the planet” = “The data have allowed 50-yr river flows to be simulated over the planet” (“data” is plural).

Corrected

11183/18-19: “The daily water level data was corrected when necessary, eventually complemented using its correlation with data of upstream or downstream stations”= “The daily water level data were corrected when necessary, with missing values estimated by correlation with data from upstream or downstream stations”.

Corrected

11184/1: “A choice was made between close stations as a function of the reliability of the records (absence of lacking value)”= “A choice was made between stations close to each other based on the reliability of their records (absence of missing values)”.

Corrected

11185/1/: “752 rain gauges were finally retained with data covering more than five-year continuous periods, and the lowest probability of errors in their series”. What is meant by “the lowest probability of errors in their series”? Does it mean “the least numbers of missing values”?

The sentence “the lowest probability of errors in their series” indicates the results from quality control method (RVM) applied previously over the rain gauges (Espinoza et al., 2009b). This sentence has been modified as follow: “A quality control based on the application of the Regional Vector Method (RVM) on the rainfall values (Espinoza et al., 2009b) was then performed over the Amazon River basin. RVM enables to discriminate stations with lowest probability of errors in their series. Finally, 752 rain gauges approved by RVM were retained, with data covering more than five-year continuous periods.”

11188-8: “underestimation of less than by 20 % of total MFF and MF”= either “underestimation of less than 20 % of total MFF and MF” or “underestimation by 20 % of total MFF and MF”(Which?)

Corrected: “underestimation of less than 20 % of total MFF and MF”

11188/24:” The study of water budget led to many estimates from models, reanalysis and lately measurements of fluxes.” This is not clear. Does it mean ” Water balance analysis led to many estimates from models, reanalysis and, subsequently, measurements of fluxes”? If not, please clarify.

Yes, corrected

11188/5: “water budget components over the whole basin are about 6.2 ± 1.1 mm d⁻¹ in precipitation P , 3.9 ± 0.7 mm d⁻¹ in evapotranspiration (ET) and 2.99 mm d⁻¹ in runoff (R). We note that the uncertainty is high in the estimations in P and E (their standard deviations are around 1.0 mm d⁻¹.)” It is not clear how the standard errors were calculated; were they calculated from the annual values? If so, a sentence to this effect might be included somewhere.

Yes, the standard errors were calculated from the annual values. We add this information in that way: (their standard deviations, calculated from the annual values, are around 1.0 mm d⁻¹).

11189/24-25: “ET is more limited by the amount of incident energy, which is the same in both simulations, rather than by precipitation change. “ What does this mean? Why should “precipitation change” lead to changes in estimated ET?

We expect that when a precipitation change is occurring, reevaporation by the surface is affected. Precipitation recycling (the contribution of evaporation within a region to precipitation in that same region) is estimated to be between 25 and 35% over the Amazon basin according to Eltahir & al. (1994). For example, a local increase in evapotranspiration adds moisture to the atmosphere which, if recycled, directly increases rainfall. But evapotranspiration is predominantly energy limited in the Amazon Basin (Karam & Bras, 2008). In our simulation ORCH2, we have only modified precipitation and not radiation. Thus, evaporation change due to the precipitation variation is not significant, in average over the basin, since the radiation is the same in the two simulations.

- Eltahir, E. A. B. and Bras, R. L. (1994), Precipitation recycling in the Amazon basin. Quarterly Journal of the Royal Meteorological Society, 120: 861–880. doi: 10.1002/qj.49712051806

- Karam, Hanan N., Rafael L. Bras, 2008: Climatological Basin-Scale Amazonian Evapotranspiration Estimated through a Water Budget Analysis. *J. Hydrometeorol.*, **9**, 1048–1060. doi: 10.1175/2008JHM888.1

11190/ “Thus, as long as ORCHIDEE does not take into account deforestation, the comparison with observation in this region may be biased where simulated ET can be overestimated”. I think this means “Thus, since ORCHIDEE does not take into account

deforestation, the comparison with observation in this region may be biased where simulated ET can be overestimated”.

Corrected

11198/26:” make this model a powerful tool to study the impact of climate change scenarios onto the river discharge.”= ” make this model a powerful tool for studying the impact of climate change scenarios on the river discharge.”

Corrected

11192: “At OBI station, about 20 % of discharge comes from southern basins (FVA), 20 % from northern basins (ACA, SER, CARA), 30 % from western/south-western basins (SPO, GAV, LAB) and 30 % from central residual basins (between SPO and MANA (hereafter called “MANA*”) and between MANA and OBI (hereafter called “OBI*”)) (Espinoza et al., 2009a)”. The use of acronyms is probably unavoidable, but the paper would be easier to read if they could be kept to a minimum.

For an easy reading, the acronyms of the stations are now replaced in the text by the full names of the corresponding stations excepted for the stations of the residual basins where acronyms with * are maintained in the text.

11193/9: “It points out an average high-flow during May and June with a maximal value of about $230 \times 10^3 \text{ m}^3\text{s}^{-1}$.” Flow is highest, on average, during May and June with a maximum value of about $230 \times 10^3 \text{ m}^3\text{s}^{-1}$.”

Corrected